[Second Edition.]

PATENT SPECIFICATION

Application Date : Sept. 27, 1928. No. 27,756 / 28.

Complete Left : June 27, 1929.

Complete Accepted : Dec. 27, 1929.

323,237

PROVISIONAL SPECIFICATION.

Improvements in or relating to Wireless Signalling Apparatus.

I, Guglielmo Marconi, G.C.V.O., LL.D., D.Sc., a subject of the King of Italy, of Marconi House, Strand, London, W.C. 2, do hereby declare the nature of this invention to be as follows:—

This invention relates to wireless signalling apparatus and more particularly to apparatus for signalling on very short waves.

Experiments made with waves of the order of 8 metres or less long have shown that very material advantages are to be obtained by employing such waves. For example, it has been found possible to effect satisfactory signalling over given distances, 200 miles for example, for 24 hours a day and substantially without any interference from atmospherics, and it would appear likely that very high signalling speeds may be attained. Further, owing to the fact that these given distances are more or less sharply limited for any given set of conditions it is possible to employ a plurality of transmitting stations operating simultaneously on the same wave length, provided that said stations are sufficiently separated. Again, it will be readily appreciated that at such very high carrier frequencies wide ranges of modulating signal frequencies, i.e. substantial side bands, may be employed without taking up a great width in the spectrum of available wave lengths. This last property renders very short waves particularly advantageous for such purposes as television and picture telegraphy.

It has been found, however, that when wave lengths of the order of 10 metres or less, are employed, communication is apt to be very seriously disturbed or even completely spoilt by the passage of interfering bodies across the line of communication and adjacent the receiving station. For example, when working with so-called beam aerials on a wave length of 6 metres interference completely swamping the signals is liable to be occasioned by the ignition systems of passing motor-cars, by tramcars, and in general by the passage of any source of impulses or other disturbances across the front of and close to the receiving station. It will be seen that this defect will become of paramount importance in cases where a road passes in front of a receiving station and it is the principal object of the present invention to obviate this disadvantage.

According to this invention there is provided in the neighbourhood of a very short wave aerial, one or more additional aerial-like screens or members, said additional members being located as close as is practicable to the probable path of disturbing bodies.

In one form of construction as applied to the protection of a beam receiving aerial working on 6 metres and fronting on a road, one or more insulated aerial-like screening members are hung above and are extended across the road, said members being located at such height as to permit the passage of the highest vehicle to be expected to pass along said road. The form of the aerial-like screening members is capable of wide modification but in one arrangement which has been successfully employed in practice each member was constituted by a plurality of rods arranged roughly transverse to the road so that the said members were formed each as an aerial-like screen extending over the road in the manner of an arch. The rods were of such length as to be generally in tune with the wave length employed (6 metres) and it was found that under these conditions disturbances due to passing vehicles were substantially eliminated.

The physical action of interference eliminating devices in accordance with this invention is not as yet wholly ascertained, but it would appear probable that such action is either wholly or in part that of a Faraday screen or of an electrostatic screen. In fact in some cases it would appear possible to form such interference eliminating devices as Faraday screens.

Dated this 27th day of September, 1928.

CARPMAELS & RANSFORD,
Agents for Applicant,
24, Southampton Buildings, London,
W.C. 2.

[*Price* 1/-]

COMPLETE SPECIFICATION.

Improvements in or relating to Wireless Signalling Apparatus.

I, GUGLIELMO MARCONI, G.C.V.O., LL.D., D.Sc., a subject of the King of Italy, of Marconi House, Strand, London, W.C. 2, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to wireless signalling apparatus and more particularly to apparatus for signalling on very short waves.

Experiments made with waves of the order of 8 metres or less long have shown that very material advantages are to be obtained by employing such waves. For example, it has been found possible to effect satisfactory signalling over given distances, 200 miles, for example, for 24 hours a day and substantially without any interference from atmospherics, and it would appear likely that very high signalling speeds may be attained. Further, owing to the fact that these given distances are more or less sharply limited for any given set of conditions, it is possible to employ a plurality of transmitting stations operating simultaneously on the same wave length, provided that said stations are sufficiently separated. Again, it will be readily appreciated that at such very high carrier frequencies wide ranges of modulating signal frequencies, i.e. substantial side bands, may be employed without taking up a great width in the spectrum of available wave lengths. This last property renders very short waves particularly advantageous for such purposes as television and picture telegraphy.

It has been found, however, that when wave lengths of the order of 10 metres or less are employed, communication is apt to be very seriously disturbed or even completely spoilt by the passage of interfering bodies across the line of communication and adjacent the receiving station. For example, when working with so-called beam aerials on a wave length of 6 metres, interference completely swamping the signals is liable to be occasioned by the ignition systems of passing motor cars, by tramcars, and in general by the passage of any source of impulses or other disturbances across the front of and close to the receiving station. It will be seen that this defect will become of paramount importance in cases where a road passes in front of a receiving station, and it is the principal object of the present invention to obviate this disadvantage.

According to this invention there is provided in the neighbourhood of a very short wave directional receiving aerial, one or more additional aerial-like screens or members, said additional members being located as close as is practicable to the probable path of disturbing bodies.

In one form of construction, as applied to the protection of a beam receiving aerial working on 6 metres and fronting on a road, one or more insulated aerial-like screening members are hung above and are extended across the road, said members being located at such height as to permit the passage of the highest vehicle to be expected to pass along said road. The form of the aerial-like screening members is capable of wide modification, but in one arrangement, which has been successfully employed in practice, each member was constituted by a plurality of rods arranged roughly transverse to the road, so that the said members were formed each as an aerial-like screen extending over the road in the manner of an arch. The rods were of such length as to be generally in tune with the wave length employed (6 metres) and it was found that under these conditions disturbances due to passing vehicles were substantially eliminated.

The invention is illustrated in the accompanying drawings in which figure 1 shows in plan and figure 2 in elevation one arrangement in accordance therewith.

Referring to the drawings, S denotes a receiving station working on short waves and intended to receive from a direction indicated by the arrow. The receiving installation comprises a beam aerial system which may be of any known kind and is represented in the drawings as consisting of a plurality of aerial wires A in combination with a plurality of reflector wires R. The effective horizontal polar curve of the beam receiving aerial is indicated by the dotted curve D C. A road R D passes in front of the receiving station S, and in order to obviate interference by motor cars, tramcars, etc., passing along the road, screening wires K are erected between the station and the road. It has been found in practice that substantially complete elimination of interference is obtained with this arrangement with screening wires tuned to the wave length to be received and separated by not more than one half wave length, said screening wires being not of sufficient height to interfere with direct reception at S. The screen appears to operate as a reflecting or screening system diverting or absorbing radiation on its own wave length produced by anything on the screened section of road.

It is not essential that the screening wires should be tuned. Substantial reduction of interference can be obtained by untuned wires larger than one wave length, though a larger number of wires will generally be required than in the case in which the wires are tuned. Also it is preferable to earth the wires and, where conditions permit, to carry them over and across the road so as to form a tunnel-like structure, earthing them at both sides of said road.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In combination a short wave directional receiving aerial system and a plurality of aerial-like screens or conductors, said screens or conductors being erected as close as practicable to the probable path of disturbing bodies and between said path and the receiving aerial system, but not in the effective path of radiation between the transmitting station from which said receiving aerial system receives and said receiving system substantially as described.

2. Apparatus as claimed in claim 1, and in which the screens or conductors are tuned to the wave length to be received, substantially as described.

3. Apparatus as claimed in claim 1, and in which the screens or conductors are earthed.

4. Apparatus as claimed in claim 1, and in which the screens extend along a road and are extended over and across said road.

5. Apparatus as claimed in claims 3 and 4, and in which the screens or conductors are earthed both sides of the road.

6. Arrangements substantially as herein described and illustrated in the accompanying drawings.

Dated this 27th day of June, 1929.

CARPMAELS & RANSFORD,
Agents for Applicant,
24, Southampton Buildings, London,
W.C. 2.

Abingdon : Printed for His Majesty's Stationery Office, by Burgess & Son.
[Wt. 8002A.—50/10/1934.]

2nd Edition

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

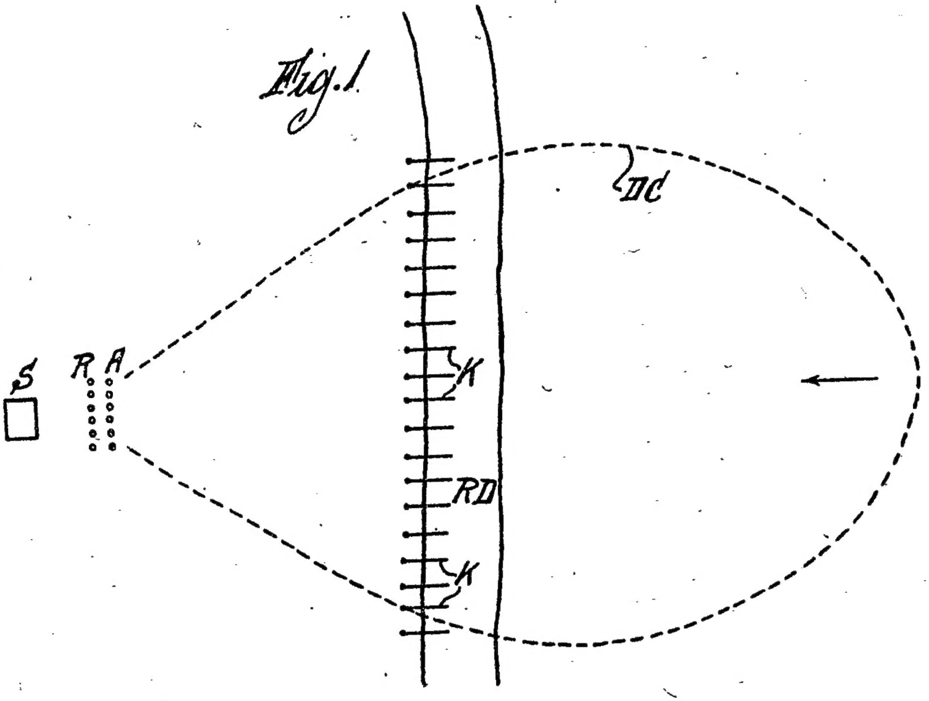
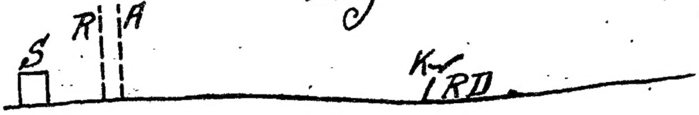


Fig. 2.



Malby & Sons, Photo-Lith.